

Application No. 10/675,331
Response dated May 3, 2005
Reply to Office Action mailed February 4, 2005

IN THE CLAIMS

1. (Original) A level measurement system, said level measurement system being powered by a two wire loop, said level measurement system comprising:

(a) a transducer for emitting energy pulses and detecting reflected energy pulses;

(b) a controller having a component for controlling said transducer, and a component for determining a level measurement based on the time of flight of said reflected energy pulse;

(c) a power supply having an input port for receiving power from the loop, and a component for producing an output voltage;

(d) a power management unit coupled to the loop, said power management unit having an output coupled to a storage capacitor for charging said storage capacitor, an input port for receiving excess power from the loop, a control terminal responsive to a control output from said controller for controlling the charging of said storage capacitor;

(e) said transducer including an input for receiving energy from said storage capacitor under the control of said controller.

Application No. 10/675,331
Response dated May 3, 2005
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2. (Currently Amended) The level measurement system as claimed in claim 1, wherein said power management unit includes a control terminal responsive to a control output from said controller for controlling the charging of said storage capacitor.
3. (Original) The level measurement system as claimed in claim 1 or 2, further including a user interface module and a communication module for transmitting level measurement data over the two wire loop.
4. (Original) The level measurement system as claimed in claim 3, wherein said controller operates said transducer intermittently and based on the charging of said storage capacitor.
5. (Original) The level measurement system as claimed in claim 4, wherein said controller operates said user interface module and said communication module continuously.

Application No. 10/675,331
Response dated May 3, 2005
Reply to Office Action mailed February 4, 2005

6. (Original) The level measurement system as claimed in claim 5, wherein said power supply comprises a switching power supply, and wherein the two wire loop comprises a current loop operable between a minimum current level and a maximum current level, and said switching power supply operating at current level less than said minimum current level, and the difference in the current levels being directed to said power management unit for charging said storage capacitor.

7. (Original) A level measurement system, said level measurement system being powered by a current loop, said level measurement system comprising:

(a) a transducer for emitting energy pulses and detecting reflected energy pulses;

(b) a controller having a component for controlling said transducer, and a component for determining a level measurement based on the time of flight of said reflected energy pulse;

(c) a power supply having an input port coupled to the current loop for receiving current at a voltage level, and said power supply

Application No. 10/675,331
Response dated May 3, 2005
Reply to Office Action mailed February 4, 2005

having a component for producing an output voltage for powering said controller;

(d) a power management unit coupled to the current loop, said power management unit having an output coupled to a storage capacitor for charging said storage capacitor, an input port for receiving excess current from the current loop;

(e) said transducer including an input for receiving energy from said storage capacitor under the control of said controller.

8. (Original) The level measurement system as claimed in claim 7, wherein said power management unit includes a control terminal responsive to a control output from said controller for controlling the charging of said storage capacitor.

9. (Original) The level measurement system as claimed in claim 7 or 8, wherein said power supply comprises a switching power supply and said switching power supply operates at a current level below the operating current level for the current loop, and said power management unit utilizes the difference in said current levels for charging said storage capacitor under the control of said controller.

Application No. 10/675,331
Response dated May 3, 2005
Reply to Office Action mailed February 4, 2005

10. (Original) The level measurement system as claimed in claim 9, further including a user interface module and a communication module for transmitting level measurement data over the current loop.

11. (Original) The level measurement system as claimed in claim 10, wherein said controller operates said transducer intermittently and based on the charging of said storage capacitor.

12. (Original) The level measurement system as claimed in claim 11, wherein said controller operates said user interface module and said communication module continuously.

13. (Original) The level measurement system as claimed in claim 12, wherein said power management unit comprises a shunt current regulator coupled to the current loop, and having control terminal responsive to a control output from said controller for shunting current from the current loop.

Application No. 10/675,331
Response dated May 3, 2005
Reply to Office Action mailed February 4, 2005

14. (Original) The level measurement system as claimed in claim 13, wherein said power management unit comprises a current sensor coupled to the current loop and having an output for indicating the current level in the current loop.